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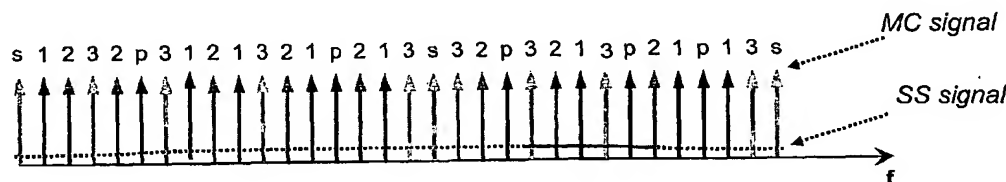
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(54) Title: **METHODS AND APPARATUS FOR OVERLAYING MULTI-CARRIER AND DIRECT SEQUENCE SPREAD SPECTRUM SIGNALS IN A BROADBAND WIRELESS COMMUNICATION SYSTEM**



(57) Abstract: A broadband wireless communication system, wherein both Multi-Carrier (MC) and Direct Sequence Spread Spectrum (DSSS) signals are intentionally overlaid together, in both time and frequency domains. The overlaying mitigates the weaknesses of each technique. The MC signal carries the broadband data signal and takes advantage of its high spectral efficiency, while the DSSS signal is used for special purpose processing such as initial random access, channel probing, and short messaging, where properties such as signal simplicity, self synchronization, and performance under severe interference are desired. The methods and techniques ensure that the MC and the DSSS signals are both distinguishable and that the interference between the overlaid signals is minimized to have insignificant impact on the expected performance of either signal.

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